

Science Committee Report to the NAC

Dr. Edward David, Chair

July 19, 2007

General Observations

- Pleased with recent progress made by SMD in:
 - R&A processes
 - Increasing suborbital and small mission flight rate
 - Early discussions of future planetary mission plans, although some dependent on future new initiatives and trade-offs with currently planned programs
- Concern across the NAC Science Subcommittees with access to space for medium-class payloads at prices comparable to the Delta-II
 - SMD is studying this issue for the Agency PMC (due Sept) and will report findings to the NAC Science Committee in October

Earth Science Decadal Survey

- The Earth Science community produced its first NRC decadal survey in January 2007
 - Highlights the need for Earth observation from space to meet societal challenges
 - Presents a coherent strategy to meet requirements for simultaneous observation of key components of the Earth system
- There exists a mismatch between the budget proposed in the Decadal Survey and the FY08 out year budget. However:
 - Congress has not yet acted on FY08
 - The Administration has not yet submitted its FY09 request
- The Science Committee endorses the steps NASA has already taken to implement the decadal survey:
 - Independent cost estimation of missions
 - Discussion with potential international partners
 - Validation of mission concept science via community workshops

ES Decadal Survey Recommendation:

Title: **Earth Science Decadal Survey Implementation**

Short Description of the Recommendation:

Recommend that NASA present to the SC at the February 2008 Meeting (once the FY09 budget comes out) the revised Earth Science plan and a comparison of budget elements with the survey recommendations, along with accompanying rationale.

Climate Free-Flyer Option for Recovery of NPOESS Sensors

- Cost over-runs in the converged civil/military weather satellite program led to “de-manifesting” of selected sensors important to climate research
- OSTP asked NASA and NOAA to conduct a study to prepare a science-based prioritization of those sensors, and options to fly them
- Options to fly these sensors:
 - Option 1 features a free-flyer satellite as a gap filler, with “re-manifesting” on NPOESS downstream
 - Option 2 continues with free-flyer satellites and does not re-converge with NPOESS
 - Option 3 expands on Option 2 by adding gap-filler sensors to planned NASA research missions
 - Option 4 continues free-flyer satellites but the redundancy, etc., to make another operational system

Climate Free-Flyer Option for Recovery of NPOESS Sensors

Short Title of Proposed Recommendation: **Free Flier Satellites for Climate Monitoring**

Short Description of Proposed Recommendation:

We recommend that long-term monitoring of climate variables from space , eliminated from the NPOESS Mission, be conducted from “climate free-flier” satellites (options 2 and 3 of the NASA/NOAA NPOESS White Paper), rather than through the NPOESS suite, for reasons of both reliability and cost. While this is a NOAA responsibility, NASA as the space agency can assist with satellite development.

Addition of Earth-Moon L1 to Lunar Architecture Options

Short Title of Proposed Recommendation: **Earth Observation from the Earth-Moon L1 point**

Short Description of Proposed Recommendation:

We ask the Lunar Exploration Architecture to recognize that satellites at the Earth-Moon L1 point supporting lunar operations would also represent excellent platforms for observing the Earth.

[addition to S-07-ESS-2]

New Principal Investigator (PI) Experience Requirement

- NASA's Science Mission Directorate (SMD) has instituted new minimum experience requirements for PI's on space missions
 - Two years experience in a senior role in a prior space mission
 - Based on perceived correlation of mission cost overruns and PI experience level
- SMD is currently conducting a study of mission cost drivers in response to a past NAC recommendation, and will report the results to the NAC Science Committee in October
 - Will inform SMD and the SC's discussion of how PI experience influences mission cost

Back-up

ES Decadal Survey Implementation Planning



Completing Building block calibrations of NRC missions

- Ensure consistent, rational basis for costs
- Full (LCC) mission cost (including NASA science teams/analyses, mission extension)
- 2 additional independent cost-estimation efforts (Aerospace, LaRC IPAO)

Discussions with International Partners (Spring 07)

- Determine common interests, complementary capabilities
- JAXA/METI (2) CNES (2), CSA, ESA, CEOS, WMO/SP, DLR meetings held
Bilateral new mission working groups initiating (CNES, JAXA, DLR)

Implementing Early Mission workshops

- Confirm/refine match between science objective and notional mission
- Determine necessary context measurements for science objective
- Community involvement, HQ lead
- Late June--late July for SMAP, CLARREO, ICESat-II, DESDynI

Developing integrated NASA mission plan

- Revised NASA Earth Science Plan
- Identify specific near-term missions to be initiated
- Mature plan to be coordinated with NOAA (integrate with NPOESS de-manifested sensor recovery strategy)